

ECONOMIC ANALYSIS AND FORECAST PAPER NR. 2/2012

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# **WHY DOES THE NBM RELAX ITS MONETARY POLICY, AND WHAT COULD BE THE RESULTS? INFLATION FORECASTS FOR 2012**

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*Summary: The purpose of this analysis is to simulate, with a Structural Vector Auto Regressive (SVAR) Model, the impact of monetary policy decisions of the National Bank of Moldova, the main factors which affect their efficiency, as well as to develop forecasts on inflation. Thus, we conclude that the main challenge for monetary authority in the process of inflation targeting is the strong influence of non-monetary inflationary factors. These depend on production costs, prices on energy resources and world prices, factors which cannot be influenced by monetary policy. Depending on the regional inflationary trends, weather conditions and a set of domestic factors (exchange rate, economic activity, production costs and monetary policy stance) we forecast a 4.5%, y-o-y inflation level for the end of 2012. It might vary by  $\pm 1$  p.p. depending on the foreign economic conditions and, respectively, on domestic food prices, climate, as well as on the global energy prices.*

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## FOREWORD

This document is based on a Structural Vector Auto Regressive (SVAR) Model, developed by the authors for the monetary sector of the Republic of Moldova. The model is used to analyze response reactions of inflation to various shocks in monetary policy, production costs, exchange rates and economic activity. Technical details of the developed model are presented in Annex 1.

The first section discusses the main causes which explain the dynamic relaxation of the monetary policy in the last few months; it presents as well the current domestic and regional general economic context.

The second section presents a proper analysis of various shocks impact on inflation. Obtained results explain the causes of slow monetary policy convergence process in Moldova and identify the key-factors that undermine the efficiency of the National Bank of Moldova (NBM) inflation targeting strategy.

The analysis concludes by presenting a short-term forecast, developed based on SVAR model, as well the factors that could cause certain forecast deviations.

## WHY DOES NBM RELAX ITS MONETARY POLICY?

On February 23<sup>rd</sup>, 2012, for the fourth month consecutively, NBM has decided to decrease the basic rate applied to the main short-term monetary policy operations. As a result, the REPO rate has reached a historically low 4.5%, the goal being to stimulate lending and to diminish the disinflationary pressures from the economy. In order to understand the reason of these actions we have to stress two main factors which, as far as we understand, guide NBM in its monetary policy easing:

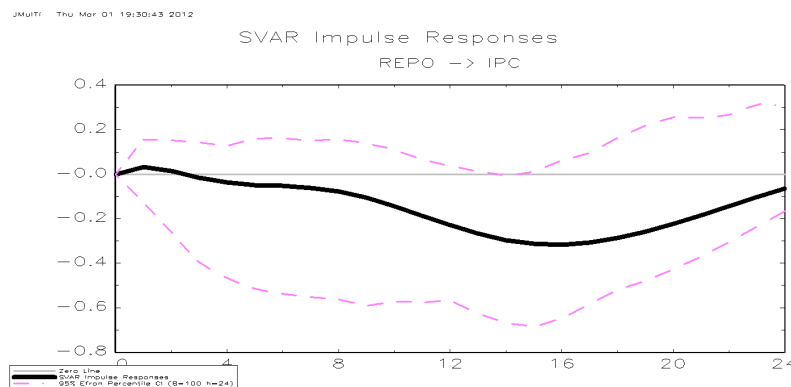
1. *Diminished inflationary expectations.* It is well known that the effects of monetary policy decisions cannot be immediately seen, but after a certain period of time. Taking into consideration this lag in the monetary policy transmission, NBM, as any other central bank, is not guided by *current* inflation, but rather by *inflationary expectations*. Thus, given the forecasted disinflationary process for 2012, the central bank adjusts its monetary policy as a function of these expectations. These are determined by: (i) elimination of the effect of tariff adjustments for services with regulated prices from the previous year; (ii) “maturing” economic growth and consumption; and (iii) a larger comparison base for this year. Thus, in essence, these factors do not imply *per se* a relaxation of the monetary policy, but just an adjustment to new inflationary expectations. However, taking into account the central bank’s inflation forecast of 4.9% for 2012, the current base rate of 4.5%, in real terms, turns to be a negative one. This fact reveals a pronounced accommodative character of the current monetary policy. On its turn, it is largely determined by:

*The risks generated by the unfolding Eurozone sovereign debt crisis, which accelerates the disinflationary process previously mentioned. It calls for a more active intervention of the central bank to spur lending, consumption and economic activity. Moreover, considering the speed of monetary policy adjustment, most probably NBM seriously examines a recession scenario for Moldova for the current year. These rather pessimistic expectations are fueled by the current slowdown of economic growth, which started in the last quarter of 2011.*

## WHAT COULD BE THE IMPACT OF MONETARY POLICY DECISIONS?

Traditionally, the main challenge of central banks is the slow monetary policy transmission process. In countries with many structural and systemic deficiencies, such as Moldova, this issue is much more acute. Thus, the impact of recent easing steps undertaken by the central bank could be seen after some period of time. How long will that period be? According to our model, a 1 p.p. increase/decrease in REPO rate results in a maximal 0.3 p.p. rise/fall of CPI, only after 16 months (Chart 1). At the same time, the shock lasts for about two years, thereafter the CPI returns to its equilibrium.

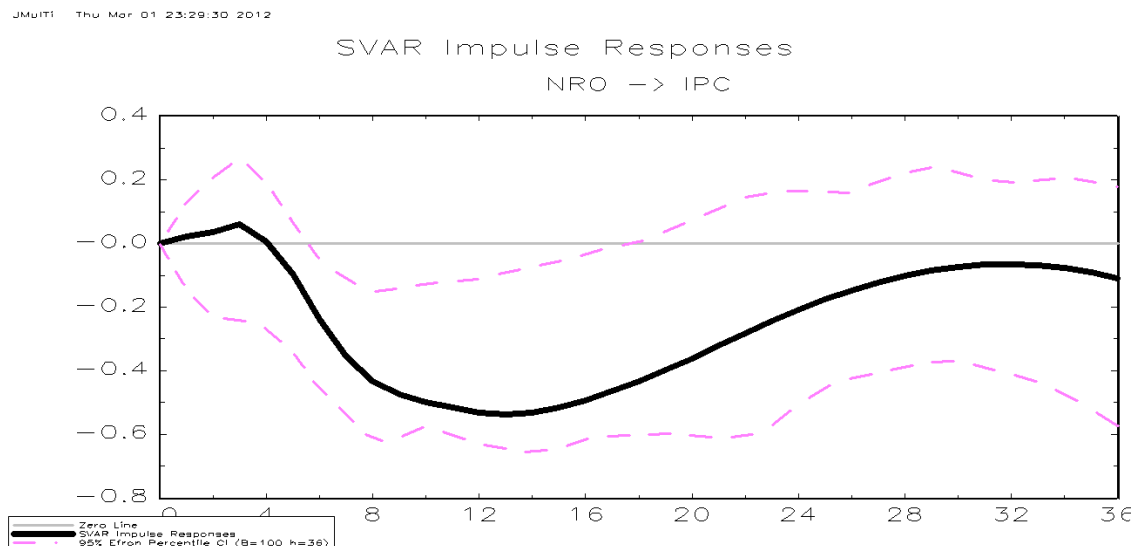
**Chart 1: Impact simulation of 1 p.p. REPO rate increase on the annual inflation growth**



Source: EG computations;

Nevertheless, NBM has an additional another monetary policy tool, considered the most extreme due to its stronger and faster impact over commercial banks and over the economy all together – rate of required reserves. From Chart 2 we note that a 1 p.p. rise in RRR generates a disinflationary effect twofold larger compared with the basic rate. Thus, the maximal decrease in CPI is 0.54 p.p. after 13 months. Meanwhile, the impact is more persistent: the shock does not die out even after 36 months.

**Chart 2: Impact simulation 1 p.p. increase in the Required Reserves Rate (RRR) over the annual inflation growth**

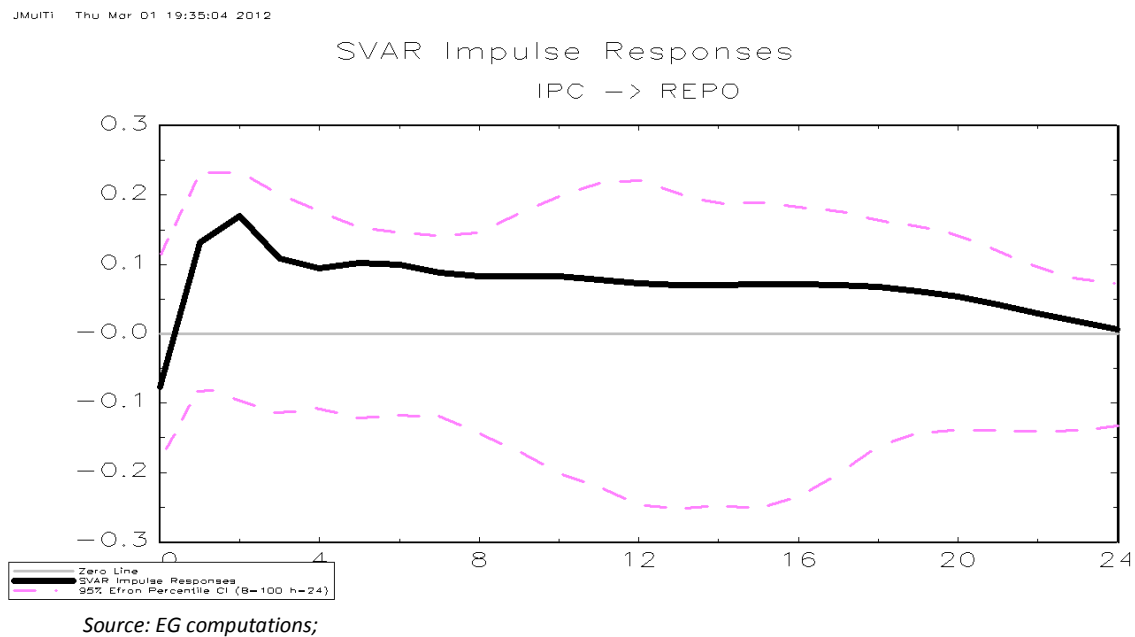


Source: EG computations;

However, besides its advantages, this monetary policy tool has many disadvantages, which probably dissuades NBM to use it as often as the refinancing rate. These especially refer to the adverse effects over the commercial banks' lending activity. Meanwhile, an increase in RRR creates a much stronger shock for the entire banking system: the share of non-performing loans in total credits rises up to a 0.9 p.p. level, while as a result of REPO rate increases – by 0.6 p.p.<sup>1</sup>. Therefore, NBM, as most central banks, resorts to this monetary policy tool only in cases very strong inflationary pressures.

Even though the monetary policy transmission process through the refinancing rate is quite slow, NBM reacts quite promptly to inflationary fluctuations, almost immediately adjusting its monetary policy. Hence, according to Chart 3, a potential inflation growth, quite shortly, generates an increase in NBM base rate. Even though the intensity of these responses is relatively low (the maximal effect as a result of 1 p.p. CPI rise is only 0.15 p.p.) these are quite persistent in time. This means that the central bank promotes, usually, an inertial monetary policy, by gradually adjusting the basic rate and spreading the shocks of the macroeconomic news over many periods of time. The purpose of such a behavior is to tackle the high economic or model uncertainty faced by NBM, as well as to avoid adverse shocks over the economic activity.

<sup>1</sup> A. Lupusor, A. Babin, "A Diagnostic Analysis of the Moldovan Banking System in the Context of Signing a Deep and Comprehensive Free Trade Agreement with EU", Expert-Grup, 2011, [http://expert-grup.org/index.php?new\\_language=0&go=biblioteca&n=224](http://expert-grup.org/index.php?new_language=0&go=biblioteca&n=224).

**Chart 3: Impact simulation of 1 p.p. CPI rise over the NBM's basic rate**

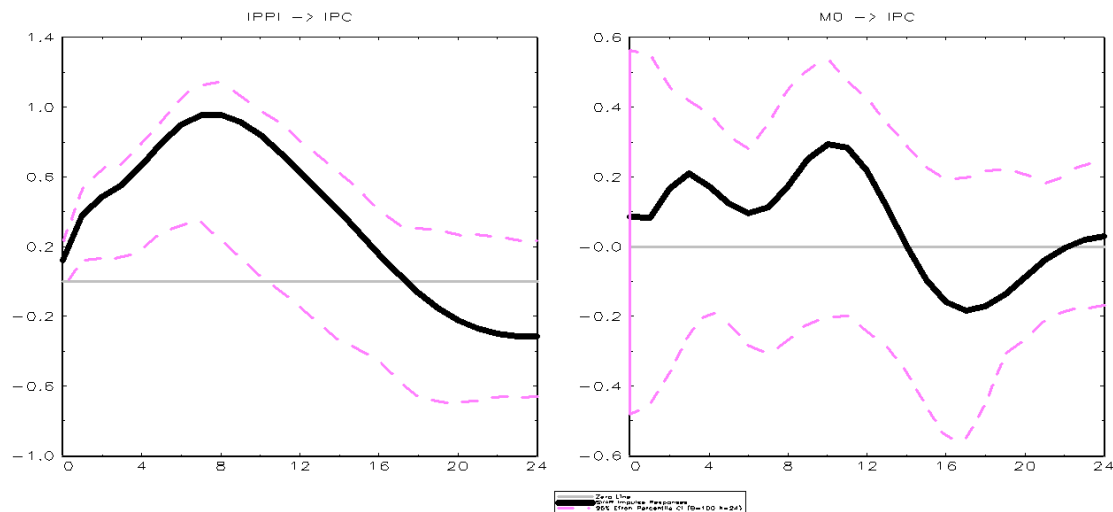
## WHAT AFFECTS THE EFFICIENCY OF MONETARY POLICY DECISIONS?

If there are no delays in NBM reactions to inflationary fluctuations, what are the factors that undermine the efficiency of monetary policy? Traditionally, one of the main challenges for any central bank depends on the price rise determined increasingly by factors outside of the monetary policy influence (e.g.: production costs increase), and less by monetary factors (e.g.: growth of lending/demand). Inflationary environment in Moldova is largely determined by the influence of production costs. For example, according to our model (Chart 4) a 1 p.p. increase/decrease of the industrial product price index (IPPI) generates a maximal 0.95 p.p. increase/decrease of the consumer price index (CPI) after 7-8 months. Meanwhile, the impact of a similar shock to the amount of money in circulation (M0 monetary aggregate), which measures the monetary inflationary pressures, is much more modest: the CPI rises/falls by only 0.3 p.p., the maximal impact being after 10 months.

**Chart 4: Impact simulation of IPPI increase (left) and of the currency in circulation (right) by 1 p.p. over CPI, annual growth**

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### SVAR Impulse Responses



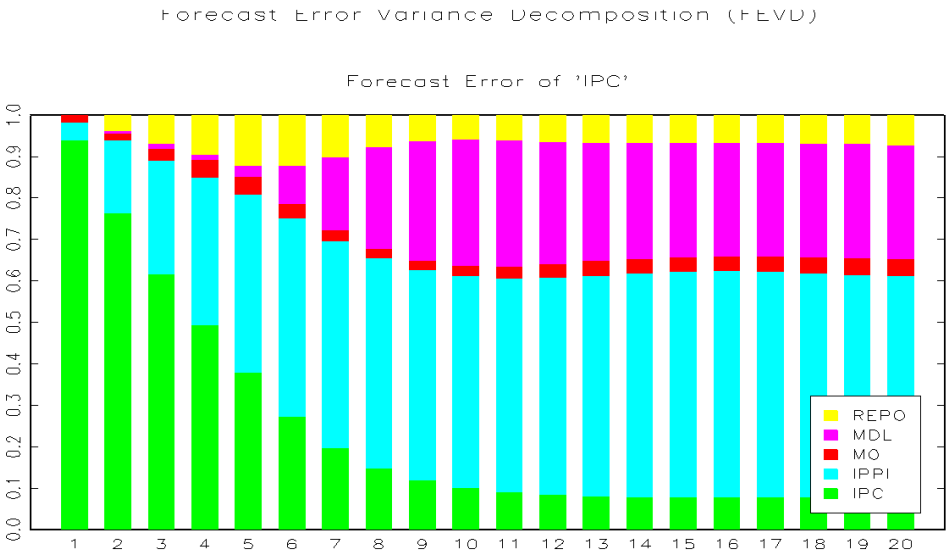
Source: EG computations;

The specific of Moldova's inflationary environment, determined increasingly by the non-monetary factors, is confirmed by Chart 5 as well, which represents a structural analysis of factors affecting the price increase. Thus, we note that, for four months in a row, the current inflation was mostly influenced by the *inflationary expectations* expressed by the previous CPI values. However, starting with the fifth month, the main factors which explain the inflationary fluctuations are the production costs expressed by IPPI; this explains the 54-55% of the total changes in inflation. In turn, production costs can be influenced by energy resources prices, by the raw material prices in the region or by other domestic and foreign fluctuations of the industrial sector – factors which cannot be tackled by monetary authorities.

As a result, we note a quite modest weight of the NBM base rate in the structure of factors which affect inflation, reaching a maximal value of 12% after a half of year and then it steadily diminishes. Even smaller is the weight of monetary factors (M0 monetary aggregate) – about 3-4% in the inflationary shocks structure. Practically, the only factor that may be influenced by NBM and which after 9 to 10 months explains 1/3 of price fluctuations is the exchange rate. However, if we take into account the experience of other countries and the inflation targeting strategy currently implemented by NBM, the exchange rate cannot be an efficient monetary policy tool. As follows, the central bank interferes on the currency market with the single goal to mitigate the excessive exchange rate fluctuations, other than that, this is determined by the market mechanism.



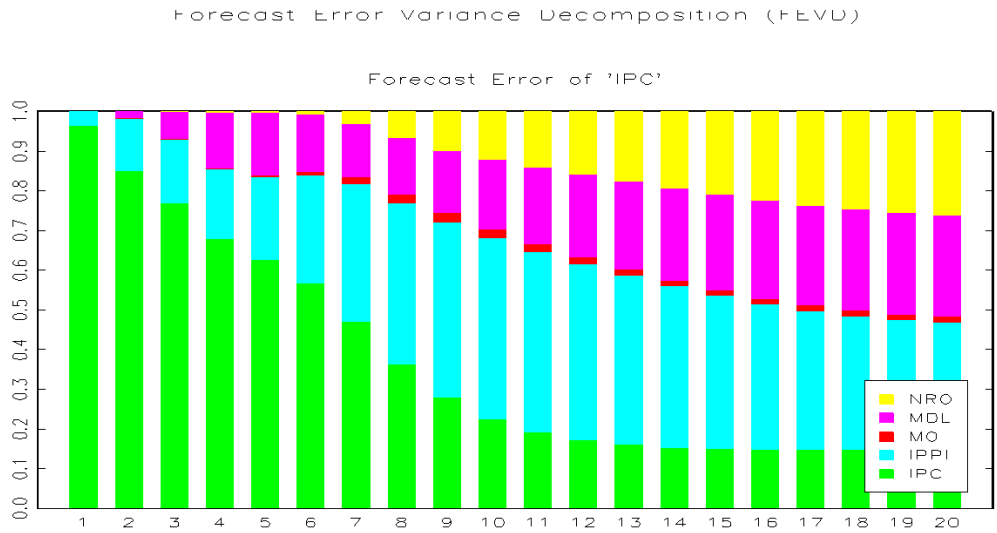
**Chart 5: The structure of main factors which affect Moldova’s prices level (forecast error variance decomposition of shocks over CPI, REPO model)**



Source: EG computations;

At the same time, the impact of monetary policy measures is much stronger when NBM uses the required reserves ratio, which has a much faster and stronger impact over the inflation level (Chart 6). In this case, the impact of monetary policy increases steadily, such that after 19 months it determines about 24% from the changes in inflation – a superior net level compared to the REPO rate. However, this is not a reason to use this monetary policy tool too often, due to the adverse effects over the banking system, mentioned above.

**Chart 6: The structure of main factors which affect Moldova’s prices level (forecast error variance decomposition of for the shocks over CPI, Required Reserves model)**



Source: EG computations;

However, at the moment, the trend of diminishing the discrepancy between CPI and core inflation - determined by the elimination of tariff adjustments effects operated last year for the utilities - suggests a smaller influence of costs-push inflationary pressures.

Thus, increased disinflationary process is based on the slowdown and cooling demand caused by the Eurozone sovereign debt crisis. In this context, which are the additional factors that may affect the effectiveness of recent monetary policy easing?

- *Significant influence of foreign economic shocks and the structural deficiencies of the Moldovan economy.* These have been discussed in detail in a recent economic analysis and forecast paper developed by the authors<sup>2</sup>. Thus, the consumption based growth model, largely financed by remittances, together with the poorly diversified and volatile markets, determine a huge exposure of the national economy to potential external shocks. Therefore, macroeconomic stabilization policies cannot be limited to the maintenance of an accommodative character of the monetary policy; it needs to be extended by a larger set of actions (e.g.: elimination of administrative constraints for the entrepreneurial activity, harmonization of the national quality standards with the European ones, improvement of the competition framework etc.). However, we note that the development of a detailed action plan in this regard does not incorporate the purpose of this economic and forecast analysis paper.
- *NBM is rather a debtor than a net lender of the banking system.* Traditionally, monetary policy transmission process in such circumstances is considered to be slower. This is caused by the liquidity surplus from the banking system. Thus, the resources accumulated over previous periods, contribute to a better “memorization” of the monetary policy from the past. As a result, the effects of the new measures taken by the central bank start to be visible much later, compared to the situation when the central bank would be a net lender and the banks would resort more intensively to NBM’s resources. For example, while the “classic” base rate reduction aims at ensuring banks with cheaper resources which they can borrow from the central bank, in Moldova, where NBM borrows from banks and not vice-versa, the main effect over lending and inflation is weaker. Thus, the impact of monetary policy easing reduces to a decrease in interest rates on T-bills and NBM certificates through which the monetary authority borrows from the banks. In this way, banks are encouraged to redirect these resources towards the real economy, spurring consumption and investment, and mitigating the disinflationary pressures. However, this shift can be more problematic in the less favorable current macroeconomic context.
- *During monetary policy easing the transmission process takes much longer compared to the period of monetary tightening.* This is a universal conclusion of the great

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<sup>2</sup> A. Lupusor, A. Babin, A. Popa, “How Vulnerable is the Moldovan Economy to External Economic Shocks? Forecasts for 2012”, Expert-Grup, 2012, <http://expert-grup.org/?go=biblioteca&n=265>

economists: M. Friedman and A. Schwartz and since 1963 is supported by most monetary policy researchers. The main cause could be that the monetary policy is counter-cyclical. Thus, monetary easing is, usually, undertaken in periods of economic slowdowns or recessionary and disinflationary risks; meanwhile, the monetary tightening is applied in times of robust economic growth and inflationary pressures fueled by demand-side factors. Hence, the efficiency of the recent monetary relaxation policies taken by NBM is affected by the uncertain current macroeconomic framework and negative economic expectations both at the national and regional level.

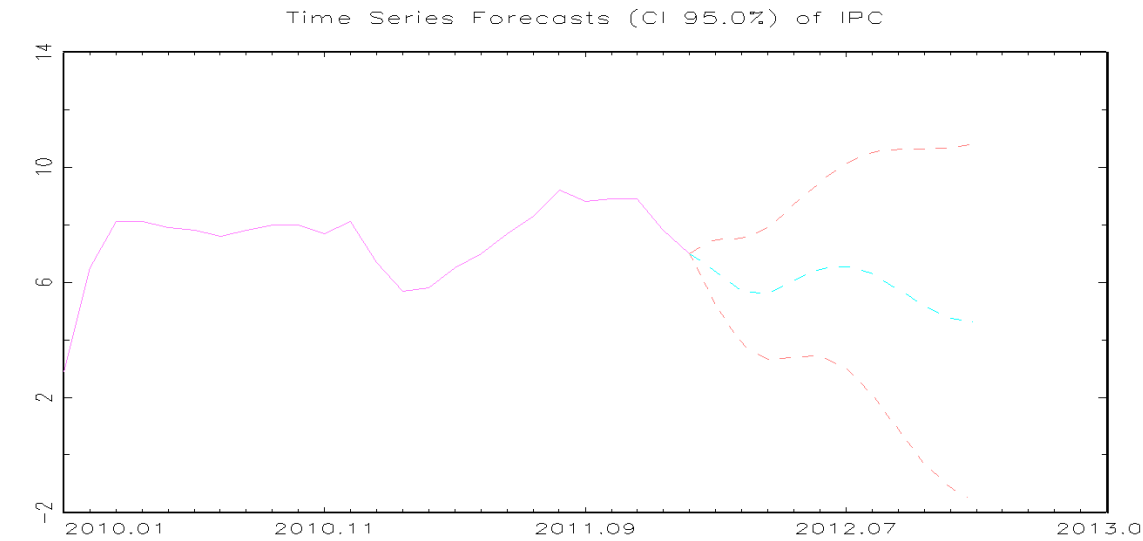
## INFLATION FORECASTS FOR 2012

From the very beginning we noted that any forecast produced in periods of high uncertainty implies a larger error margin. Another challenge relates to the increased volatility of regional food prices, as well as of the general inflationary foreign environment, which significantly influences the domestic one. Taking into account the extremely open character of the Moldovan economy, these issues are even more acute.

In order to minimize the forecast error, our model takes into account the domestic environment factors (amount of cash in circulation, industrial production price index, base rate of the central bank, exchange rate and inflation from previous periods), as well as factors which describe the changes of foreign prices (global food prices and Eurozone inflation). The last category of factors is defined outside of the model, based on forecasts used by international organizations (European Central Bank and the Food and Agriculture Organization of the UN). Meanwhile, we have included a variable that defines the climate conditions, taking into account that it influences the supply of agricultural goods and, thus, the price level.

Therefore, ***we forecast an annual consumer price index of about 4.5% by the end of 2012***(Chart 7). This may vary within a 1 p.p. interval. Thus, it may reach a 3.5% in case of a stronger than expected decrease in the world food prices or of worsening of economic conditions from the region. On other note, the inflation level may reach even a 5.5% if the price rise in the region will exceed the expected level. Such a situation might happen as a result of: (i) dynamic improvement of the foreign economic situation; (ii) agricultural crops supply decrease as a result of the unfavorable weather conditions; (iii) strong increase in oil prices as a result of banning the oil exports from Iran (the fourth largest oil exporter in the world) and blocking the oil products transit through the Hormuz Strait.

Chart 7: Annual CPI forecast for 2012 based on SVAR model



Source: EG computations;

## ANNEX: STRUCTURAL VECTOR AUTO REGRESSIVE (SVAR) MODEL

Classical VAR models represent systems of several equations, in which every endogenous variable is regressed with the other endogenous variables for current and lagged periods, and with other exogenous variables, depending on specific restrictions. To get a better specification we have used the Structural Vector autoregressive Model (SVAR) which, unlike the ordinary VAR model with Cholesky restrictions, is a non-recursive one, with specific restrictions applied to current and lagged periods. The decision on the application of these restrictions derives from the economic theories and peculiarities of Moldovan economy.

The model includes 8 variables, with monthly frequency, for 2004:01 – 2012:01 period.

*CPI* – consumer price index, % y-o-y rise

*IPPI* – industrial production price index, % y-o-y growth

*M0* – the volume of cash in circulation, y-o-y, seasonally adjusted, % growth

*MDL* – exchange rate MDL/USD, % y-o-y growth

*REPO* – NBM's base rate applied to the main monetary policy operations, % (in other statements RRR – required reserves rate was tested as an alternative variable)

*FOOD\_w* – Global food prices, y-o-y % growth, (exogenous variable)

*IPC\_EU17* – Harmonized consumer price index from the Eurozone, y-o-y % growth, (exogenous variable, computed by Eurostat).

*mm* – average amount of rainfall, seasonally adjusted, natural logarithms (used as a variable that approximates the weather conditions).

Three periods SVAR model was selected Based on Akaike information criterion. Restrictions and model specification are presented in table 1 and 2:

**Table 1. Model's structure with current periods' regressions**

	CPI	IPPI	M0	MDL	REPO
CPI	*	*	*	0	0
IPPI	0	*	0	0	0
M0	*	0	*	0	0
MDL	0	0	*	*	0
REPO	*	0	*	0	*

**Table 2. Model's structure with previous periods' regressions**

	CPI	IPPI	M0	MDL	REPO	FOOD_w	IPC_EU17	MM
CPI	*	*	*	*	*	*	*	*
IPPI	0	*	*	*	0	0	*	0

<b>M0</b>	*	*	*	0	0	0	0	0
<b>MDL</b>	0	0	*	*	*	0	0	0
<b>REPO</b>	*	0	0	0	*	0	0	0

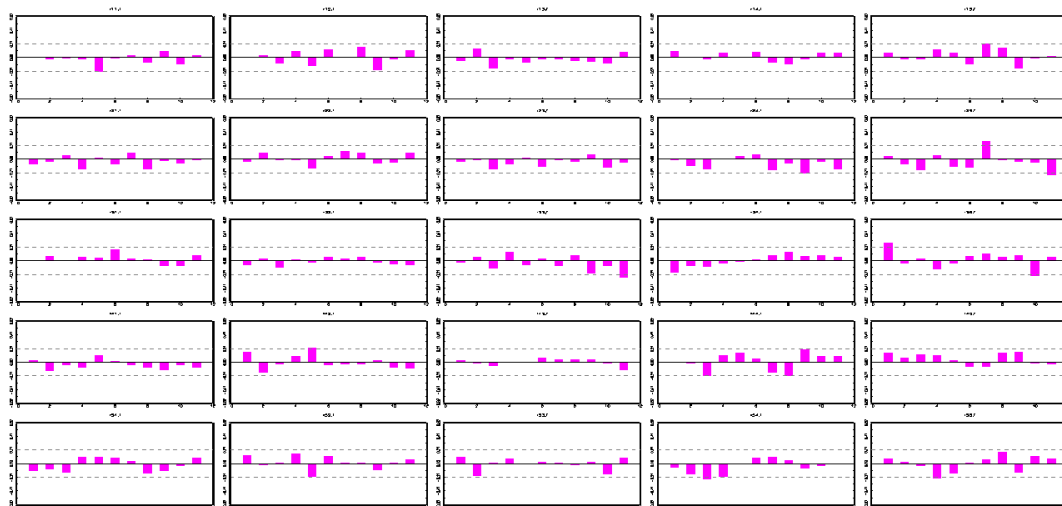
Thus, the main hypotheses included in the model are as follows:

- The inflation level is determined by the current periods of the production costs and of the monetary factors, as well as of the previous periods of the CPI, production costs, the amount of cash in circulation, exchange rates, monetary policy, global food prices and Eurozone inflation (due to the openness of the Moldovan economy).
- Production costs are determined only by the IPPI previous periods, by the amount of cash in circulation, the exchange rate and Euro zone inflation, which affects the costs of raw materials.
- The amount of money in circulation is determined by the current periods of the CPI and the previous periods of CPI, IPPI, M0 and M0.
- The exchange rate is determined by the current periods of the M0 and the previous ones of the M0, MDL and REPO.
- The reaction function of the central bank is composed of monetary inflationary pressures (M0) and the CPI current value.
- The weather conditions influence the agricultural products supply and the price level, respectively.

The plausibility of the current specification is confirmed by the lack of significant dependencies among the error terms derived from the model (Chart 8):

**Chart 8: Correlation among error terms**

Crosscorrelations



Therewith, the stability of the model is confirmed by CUSUM test (Chart 9):

